

Allegation of Scientific Misconduct in (b) (6)

Report to the U.S. EPA Scientific Integrity Review Panel

August 25, 2015

Introduction

The U.S. Environmental Protection Agency (EPA) is dedicated to preserving the integrity of the scientific and scholarly activities it conducts and that are conducted on its behalf. The EPA Scientific Integrity Policy, dated February 2012, provides principles and standards to ensure scientific integrity in the use, conduct, and communication of science. The Policy applies to EPA employees, contractors, and grantees. When this Policy is not adhered to, or is circumvented, the robustness of EPA science and the trust in the results of our scientific work can be impacted, causing a loss of scientific integrity. Loss of scientific integrity is the result of a deliberate action by an employee that compromises the conduct, production, or use of scientific and scholarly activities and assessments. EPA does not tolerate loss of integrity in the performance of scientific and scholarly activities or in the application of science in decision making.

Procedures for Resolving Allegations of a Loss of Scientific Integrity

Allegations of the loss of scientific or scholarly integrity are submitted to the EPA's Scientific Integrity Official (ScIO). Three criteria are considered when establishing a loss of integrity:

- 1) There is a significant departure from accepted practices of the relevant scientific or scholarly community;
- 2) The actions causing the loss of integrity are committed intentionally, knowingly or recklessly; and,
- 3) The allegation is proven by a preponderance of evidence.

If there is a reasonable basis to believe the allegation may have merit, a Scientific Integrity Review Panel, comprised of the ScIO, the relevant Deputy Scientific Integrity Official(s) (DScIO), and an impartial DScIO provide a review of the science and any other relevant information and reach a majority consensus.

Allegation

(b) (6) has alleged that EPA Region (b) (6) contractors engaged in scientific misconduct in preparation of a research report entitled, "(b) (6)". The report was prepared by (b) (6) of The (b) (6) and finalized in November 2006. (b) (6) has asked that EPA Region (b) (6) either retract the 2006 study from the EPA Region (b) (6) website or qualify the study's conclusions.

(b) (6) filed an EPA Office of Inspector General (OIG) Hotline complaint in March 2013. He sent an email with his concerns to the ScIO in August 2014. The ScIO told (b) (6) that the OIG was investigating his allegations. In February 2015, the OIG found that the allegation did not rise to the level of criminal charges of scientific misconduct and referred the case to the ScIO.

Scientific Integrity Review Panel

A Scientific Integrity Review Panel (SIRP) comprised of Francesca Grifo, Ph.D. (the SciO), (b) (6) (the (b) (6)), (b) (6), and (b) (6) was convened to review the relevant information on the case.

Background

According to the National Association of Corrosion Engineers,

“Galvanic corrosion (also called 'dissimilar metal corrosion' or wrongly 'electrolysis') refers to corrosion damage induced when two dissimilar materials are coupled in a corrosive electrolyte. It occurs when two (or more) dissimilar metals are brought into electrical contact under water. When a galvanic couple forms, one of the metals in the couple becomes the anode and corrodes faster than it would all by itself, while the other becomes the cathode and corrodes slower than it would alone.”¹

In the present case, when a municipality replaces old lead service pipes with copper pipes (only up to the property boundary), the lead and copper pipes may be in contact. The lead pipe functions as the anode, the copper pipe as the cathode, and drinking water in the pipes functions as the electrolyte. Galvanic corrosion can occur, whereby the lead can dissolve. The concern is that, by replacing part of the lead pipe, the result may be an increase in lead in the drinking water, due to galvanic corrosion.

In July 2004, EPA Region (b) (6) funded a study to determine whether (b) (6) was a significant contributing cause of the drinking water lead contamination in the District of Columbia. The report, titled, (b) (6), was prepared by (b) (6).

(b) (6) and finalized in November (b) (6). The report found that grounding and impressed currents moving along lead service lines have no meaningful impact on internal pipeline corrosion and do not likely contribute to metals release. The report also concluded that (b) (6) impacts can be substantial on unpassivated lead surfaces, but the magnitude of impact on aged and passivated lead surface lines is so minimal as to be inconsequential. (b) (6) et al. published a related article, with (b) (6) as a co-author, in the Journal of American Water Works Association (JAWWA) in March 2012³.

Analysis

For several years, (b) (6) (b) (6) has expressed his concerns regarding the 2006 EPA report on galvanic corrosion and, in the last few years, regarding the related March 2012 JAWWA article by (b) (6) et al. (b) (6) has taken his concerns to EPA Region (b) (6) to the authors of the study and the article, to JAWWA, to the EPA Office of Inspector General (OIG), and to EPA's SciO.

¹ <https://www.nace.org/Corrosion-Central/Corrosion-101/Galvanic-Corrosion/>

(b) (6)

³ <http://www.awwa.org/publications/journal-awwa/abstract/articleid/29961237.aspx>

(b) (6) concerns:

- He questions the scientific integrity of the 2006 report.
- He claims that he discovered that (b) (6) used fabricated graphs in his related article, published in the March 2012 edition of JAWWA.
- His lab devoted two person-years duplicating the studies done for the 2012 article. The results from (b) (6) lab were consistent with electrochemical principles and other published research, but contradicted the results and conclusions of the article.
- He alleges that the 2006 report has numerous false statements, fabricated figures, and that the report's conclusions run counter to established electrochemical principles and to published research.
- He tried for years to obtain the study's data, the Quality Assurance Project Plan (QAPP), and the Quality Management Plan (QMP) for the contract from EPA Region (b) (6) and from the authors. The data, QAPP, and QMP apparently are not available.

(b) (6) has asked that EPA Region (b) (6) either retract the 2006 study from the EPA Region (b) (6) website or qualify the study's conclusions.

Concerns about Related 2012 Article:

(b) (6) the first author of the 2006 report, was also the second author on a related, peer-reviewed article published in March 2012 by (b) (6) et al.

In a March 12, 2013, email message to the EPA ombudsman hotline, (b) (6) stated,

I have also alleged that the first author of this report fabricated data appearing in a peer reviewed journal article on the same subject, and in that publication, cited data in the EPA R (b) (6) research report. Graphs appearing in the EPA R (b) (6) research report also appear to be highly irregular and are not representative of actual scientific data, and it is my suspicion that they are fabricated. Finally, key elements reported in a draft report, are directly contradicted in the final report.

In a December 16, 2013, email message for Dr. Grifo, (b) (6) stated,

I caught the sub-contractor who did the work for them, fabricating graphs for a related peer reviewed publication, and writing the text for the peer reviewed paper before even collecting the experimental data. This is openly acknowledged in their e-mails. The data do not agree with the text of the peer reviewed paper. The conclusions of the EPA report have now been refuted in the peer reviewed literature by 2 independent groups and myself. I believe that many of the graphs in the EPA report are also fabricated.

According to (b) (6) did not use the same data for their 2012 article as (b) (6) used for the 2006 report. In an August 5, 2015, email message to Martha Otto, EPA/OSA, (b) (6) stated,

To my knowledge, none of the data in the 2012 article use the data from the 2006 report.

The only link between the two are as follows:

- 1) the 2012 article references the 2006 report
- 2) (b) (6) is first author of the 2006 report, and co-author of the 2012 paper. He wrote the section of the 2012 paper with the hand-drawn Figure 9 and Figure 10 issues. I feel that the 2012 paper further establishes his pattern of behavior.
- 3) The 2006 and 2012 efforts are on the same subject, and draw the same essential conclusion. That is, galvanic corrosion does not pose a significant concern relative to lead in water.

(b) (6) was engaged in a public debate on whether JAWWA should retract the 2012 (b) (6) article. (b) (6) wrote an article in the December 2012 JAWWA, entitled, "Discussion: Effect of Changing Water Quality on Galvanic Coupling."⁴ He also wrote a letter to the JAWWA editors in January 2014.⁵ In both cases, (b) (6) responded. His responses included admissions of errors associated with the figures in the article. The JAWWA Board of Directors suggested that (b) (6) correct the errors in Figures 9 and 10 by way of the authors submitting an erratum for publication in Journal AWWA. The Scientific Integrity Program could not find that such an erratum has been published. Also, in his August 5, 2015, email message to Martha Otto, ORD/OSA, (b) (6) stated that (b) (6) never submitted an erratum. In an August 25, 2015, email message from (b) (6) of JAWWA, to Martha Otto, he said that the call for an erratum should have referenced the December 2012 response from (b) (6) in which (b) (6) explained the errors. However, the JAWWA board's 2014 call for an erratum did reference (b) (6) 2012 explanation of the errors and yet the board still called for an erratum.

(b) (6) also wrote a letter to the JAWWA editor, in which he expressed concerns about the results and conclusions in the (b) (6) article. According to (b) (6) "These observations are directly counter to the well-understood principles underlying galvanic corrosion. There is no known science that can explain an increased galvanic effect for samples that are more separated in distance than for closer samples. The observations can only be explained by an unknown artifact or error in measurement."

To date, the JAWWA editors have declined to retract the (b) (6) article. However, in January 2014, the JAWWA editors published an Expression of Concern⁶, in which they encourage caution by any readers accessing the article:

"Individuals accessing this article and related documents (all of which are listed below) are urged to use caution regarding its results. Questions raised subsequent to publication were not fully answered by the authors. *Journal* encourages readers to be attentive to future research that may provide more clarity on this topic."

⁴ <http://www.awwa.org/publications/journal-awwa/abstract/articleid/34659220.aspx>

⁵ <http://www.awwa.org/publications/journal-awwa/abstract/articleid/43058335.aspx>

⁶ <http://www.awwa.org/publications/journal-awwa/abstract/articleid/43058335/issueid/40067698.aspx?getfile=/documents/dcdfiles/43058335/jaw201401letters.pdf>

Additional (b) (6) Review:

The scientific integrity program asked (b) (6) in (b) (6) (b) (6) and an expert in corrosion and treatment chemistry, to review the allegation, the timeline, and the draft recommendation. He strongly concurred with the draft recommendation.

Recommendation

(b) (6) has alleged scientific misconduct related to the 2006 EPA Region (b) (6) report titled, (b) (6) (b) (6) The Scientific Integrity Program staff has evaluated the allegation.

The Scientific Integrity Program notes the following:

- Graphs appearing in the 2006 report may have been fabricated;
- There apparently are no data available that could support the 2006 report;
- There is apparently no QAPP or QMP from the contract through which the 2006 report was funded;
- Previous and recent research contradicts the results and conclusions of the report; and,
- (b) (6) pointed out errors in a related 2012 JAWWA article by (b) (6) in a section written by (b) (6) the first author of the 2006 report. According to the journal's editors, Boyd et al. have not fully addressed the errors. (b) (6) maintains that the errors in the 2012 article further establish (b) (6) pattern of behavior.

Criteria to Establish a Loss of Scientific Integrity	Findings by the Scientific Integrity Program
A significant departure from accepted practices of the relevant scientific or scholarly community?	<p>Yes.</p> <ul style="list-style-type: none">• The 2006 report includes figures that may have been fabricated.• No one has been able to produce the data to support the report's conclusions.• There is no QAPP or QMP associated with the report's underlying research, although they were required for EPA contracts during this timeframe.• (b) (6) the first author of the 2006 report, was the second author of a related journal article. A section of that article that he wrote has been criticized and, according to the journal editors, "Questions raised subsequent to publication were not fully answered by the authors."

The actions causing the loss of integrity were committed intentionally, knowingly or recklessly?	<p>Not really known. However:</p> <ul style="list-style-type: none">• The 2006 study had no QAPP or QMP, although these were required for EPA contracts during that timeframe.• (b) (6) started asking for the underlying data before the report was finalized. No one has been able to produce the data.• (b) (6) has not sufficiently supported his claims of innocent errors in a related article.
The allegation is proven by a preponderance of evidence?	The evidence indicates that the report is not supported by reliable data.

The EPA Scientific Integrity Program recommends that the SIRP agree that enough valid questions have been raised to either warrant removing the 2006 report from EPA's websites or including a statement qualifying the report's conclusions.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

9/2015

OFFICE OF THE
SCIENCE ADVISOR

(b) (6)

Dear (b) (6)

This is in response to your concerns regarding the EPA funded report entitled (b) (6) (b) (6) prepared by (b) (6) formerly of (b) (6) and finalized in November 2006. You had asked that EPA either retract the 2006 study from the EPA Region website or qualify the study's conclusions.

EPA has reviewed your concerns. As a result of the review, EPA has attached the following statement to the 2006 report:

NOTICE: EPA does not have the data, a Quality Assurance Project Plan, or a Quality Management Plan associated with this 2006 report entitled (b) (6)

(b) (6) The report was prepared by (b) (6) formerly of (b) (6) and finalized in November 2006. Readers are cautioned that other research has not reached the same conclusion as the report and the Science Advisory Board (SAB) has discussed reasons for the discrepancy. When asked to comment on whether partial lead service line replacement (PLSLR) might cause elevated lead levels at the tap due to galvanic corrosion, the SAB concluded that:

The number of studies to examine the ability of PLSLR to reduce lead exposure is small and those studies have major limitations (small number of samples, limited follow-up sampling, lack of information about the sampling data, limited comparability between studies, etc.). Overall the SAB finds that, based on the current scientific data, PLSLRs have not been shown to reliably reduce drinking water lead levels in the short term, ranging from days to months, and potentially even longer. Additionally, PLSLR is frequently associated with short-term elevated drinking water lead levels for some period of time after replacement, suggesting the potential for harm, rather than benefit during that time period. Available data suggest that the elevated tap water lead levels tend to then gradually stabilize over time following PLSLR at levels both above and below those observed prior to PLSLR.

More information can be found in the Science Advisory Board report at:

<http://vosemite.epa.gov/sab%5Csabproduct.nsf/964CCDB94F4E6216852579190072606F/SFile/EPA-SAB-11-015-unsigned.pdf>

Thank you for bringing your concerns about the 2006 report to our attention. EPA now considers this case (your allegation of a loss of scientific integrity) closed. Please note that a decision regarding an allegation of a loss of scientific integrity at EPA may be appealed, but it can only be appealed once. The appeal must be made by an involved party in the original inquiry. Also, the appeal only will be considered if it provides additional or new information relevant to the original allegation.

Sincerely,

A handwritten signature in black ink, appearing to read "Francesca T. Grifo for". The signature is stylized and cursive.

Francesca T. Grifo, Ph.D.
Scientific Integrity Official